

## Bioprocess Engineering

### P-007 - HIGH HYDROSTATIC PRESSURE AND PEDIOCIN PA-1 AS A SYNERGISTIC SYSTEM TO *LISTERIA MONOCYTOGENES* INACTIVATION IN FERMENTED MEAT SAUSAGE

Cláudia Maciel<sup>1</sup>; Norton Komora<sup>1</sup>; Vânia Ferreira<sup>1</sup>; Jorge Saraiva<sup>2</sup>; Sónia Marília Castro<sup>1</sup>; Paula Teixeira<sup>3</sup>

1 - Universidade Católica Portuguesa, CBQF – Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Rua Arquiteto Lobão Vital, Apartado 2511, 4202-401 Porto, Portugal; 2 - QOPNA - Organic Chemistry, Natural Products and Food Stuffs, Chemistry Department, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal.; 3 - Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Rua Arquiteto Lobão Vital, Apartado 2511, 4202-401 Porto, Portugal

#### Background

In the last two decades, the consumer's behaviour has experienced a global upsurge and on-going trend for healthier, fresh and natural foods. The growing demand for locally produced and minimally processed food, as well as the increased awareness of environmentally friendly technologies for food processing, turn out to be a relevant point in the consumer's buying decision. For this reason, the use of non-thermal technologies as high hydrostatic pressure (HHP) and biocontrol agents represents an interesting processing option to maintain food freshness and simultaneously reduce the microbial load. The aim of this work was to evaluate the combined effect of mild HHP and pediocin PA-1 as a potential *hurdle technology* to inactivate *Listeria monocytogenes* in Portuguese traditional fermented meat sausages.

#### Method

*Pediococcus acidilactici* HA-6111-2, isolated from a fermented meat sausage ( $10^7$  CFU/g) or its semi-purified bacteriocin pediocin PA-1 (1280 AU/g) were added to the sausage paste (ca. 100 g) previously inoculated with *L. monocytogenes* ( $10^4$  CFU/g). Two different strains were selected to perform separate assays, *L. monocytogenes* Scott A, a well described strain in HHP and *L. monocytogenes* 1942, isolated from Portuguese fermented meat sausage. Samples were pressurized at 300 MPa (10 °C), for 5 min and stored at atmospheric pressure (0.1 MPa) under refrigeration (4° C).

#### Results & Conclusions

For both *Listeria* strains, all treatments achieved enumeration below the detection limit of the enumeration technique, excluding samples inoculated just with *L. monocytogenes* cells (pressurized and non-pressurized). All treatments (*P. acidilactici* HA-6111-2 or its semi purified bacteriocin) reduced *L. monocytogenes* to undetectable levels by enrichment protocol throughout shelf life of fermented sausages at 4 °C. The synergistic effect of HHP and pediocin PA-1 reduced the *L. monocytogenes* initial load to undetectable levels immediately after HHP treatment, whereas combination of HPP and *P. acidilactici* HA-6111-2 resulted in the absence of the pathogen 72h after the treatment. In non-pressure treated samples inoculated with pediocin PA-1 or *P. acidilactici* HA-6112, *L. monocytogenes* was not detected only at 14 and 21 days of refrigerated storage, respectively.

The multi-hurdle technology herein presented constitutes a promising minimal food processing alternative, representing an eco-friendly technology for food decontamination and preservation.

#### References & Acknowledgments

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